

<Articles>On the Structure of Causative Varbs and Adverb Scope Ambiguity

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On the Structure of Causative Verbs and Adverb Scope Ambiguity*

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1. Introduction

This paper investigates the phrase structure of causative transitive verbs in English. A standard view is that these verbs have a double-VP structure in which the upper verb phrase expresses the causing event and the lower one corresponds to the event or state that is caused. However, some researchers have cast doubt on this analysis, pointing out that causative transitive verbs do not exhibit scope ambiguity with VP-adverbs (Fodor (1970), Pykkänen (2002)). I would like to demonstrate here that in fact, scope ambiguity is found with a type of causative verb, verbs of change of location, and argue that the data provide a piece of solid evidence for the double-VP analysis of these verbs. It is also noted that such ambiguity is not found with another type of causative verb, verbs of change of state. I will claim that change of state verbs are distinguished from change of location verbs in that the lower verb lacks a feature required to license the adverbs. Furthermore, this paper points out some problems with the analysis that decomposes these verbs into a causative verb and a category-neutral root (Pykkänen (2002)).

The organization of this paper is as follows. In section 2, we review the basic motivation for the double-VP analysis of causative verbs and an argument against the analysis proposed by Pykkänen (2002) on the basis of the scope of adverbs. We then consider her alternative analysis. In section 3, through a closer examination of the adverbs discussed by Pykkänen, I point out that her analysis seems to encounter difficulties in explaining them. In section 4, I argue that some of the data presented in section 3 are accounted for under the double-VP analysis on a principled ground and provide evidence for the analysis. Finally, concluding remarks are made in section 5.

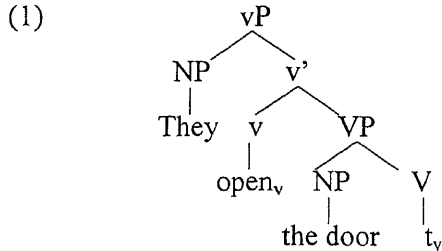
2. Previous Studies

In this section, we consider motivation for the VP-shell analysis of causative transitive verbs discussed in previous works. Then we look at data concerning adverbs modifying these verbs presented in Pykkänen (2002) and her analysis of them.

* This paper has benefited greatly from comments and suggestions made by Yurika Kambe, Momoko Kodaira, and Tetsuya Kogusuri on its earlier versions, for which I am most grateful. I am also indebted to Lisa Travis for insightful comments on some of the data presented here. My thanks also go to Gerry Allen, Richard Caraker, Stephen Henneberry, and Mark Valley for kindly acting as consultants for some of the data provided here. I remain responsible for any errors.

2.1. VP-Shell Structure and Scope of Adverbs

It has become a fairly standard view that transitive verbs have a double-VP structure, as in (1), an idea coming from analyses of these verbs in Hale and Keyser (1993), Chomsky (1995), and Kratzer (1996). The agent (or, more broadly, causer) is generated as an argument of the upper verb *v*, and the theme as an argument of the lower verb *V*. The transitive verb is derived by combining *V* with *v*.



This structure is motivated by the convergence of lexical semantics and syntax concerning transitive verbs (see Baker (2003) for discussion).

As for semantics, causative transitive verbs are analyzed as consisting of a certain kind of CAUSE operator and a predicate expressing the event or state that is caused (Dowty (1979), Parsons (1990)). The agent is taken as the first argument of the CAUSE operator and the theme is a subpart of the event or state that is the second argument of CAUSE (cf. Jackendoff (1976, 1983)). This line of compositional semantic analysis of transitive verbs is compatible with the structure in (1): the upper verb *v* corresponds to the CAUSE element and selects the agent, whereas the lower verb *V* corresponds to the result-expressing predicate and selects the theme.

Concerning syntax, it is well-known that the agent argument behaves like being higher than the theme with respect to several phenomena such as anaphora and movement. As shown in (2), a quantified agent NP can bind a pronoun contained in the theme NP, while the opposite dependency cannot be established between the two NPs (Reinhart (1983)). Moreover, as shown in (3), a *wh*-phrase as the theme cannot be moved over another *wh*-phrase as the agent (Chomsky (1973)):

- (2) a. Every female student_i insulted her_i linguistics professor.
 b. ?*Her_i favorite student insulted every linguistics professor_i.
- (3) a. Which student insulted which professor?
 b. *Which professor did which student insult?

(Baker (2003:80))

These facts are accounted for with the structure in (1) because the agent asymmetrically c-commands the theme.

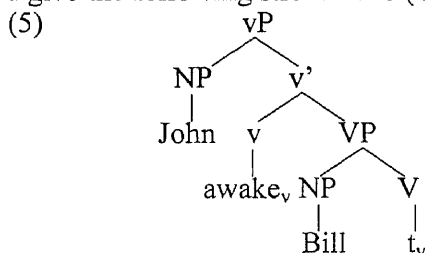
However, this type of decomposition analysis of causative transitive verbs has been challenged by the following observation. In (4a), a manner adverb *grumpily*

appears in a sentence with a causative verb *awake*, while in (4b) the same adverb is in a sentence with the verb's noncausative (unaccusative) counterpart:

- (4) a. John awoke Bill grumpily.
b. Bill awoke grumpily.

(Pylkkänen (2002:92))

In (4a), the adverb unambiguously modifies John's action and not Bill's awakening, though the same adverb modifies Bill's awakening in (4b). Pylkkänen (2002) indicates that this is unpredicted under the decomposition analysis shown in (1), which would give the following structure to (4a):



She claims that the adverb, as a VP modifier, should be able to attach either at the upper or the lower verb phrase. It should modify the causing event if it adjoins to the upper one, whereas it should modify the caused event if it adjoins to the lower. However, contrary to this prediction, only the reading in which the adverb modifies the causing event is available (cf. Fodor (1970)).¹

In this subsection, we saw that the VP-shell analysis of causative transitive verbs is motivated by the convergence of lexical semantics and syntax of the sentences involving these verbs. Then we noted that the analysis has been challenged by the observation that these verbs do not exhibit scope ambiguity with respect to VP-adverbs.

2.2. Pylkkänen's (2002) Analysis

Taking the data in (4) into account, Pylkkänen (2002) proposes an alternative analysis of causative transitive verbs in English. She also considers the interpretation of degree adverbs accompanying these verbs. For example, in (6), the adverbs are interpreted as modifying the resultant states of the causatives, without modifying the causing event:

¹ Fodor (1970) argues against deriving transitive verbs such as *kill* and *melt* from a biclausal causative structure, considering the interpretation of time and instrumental adverbials. He observes that these verbs do not show scope ambiguity with the adverbials, and concludes that they lack internal structures on which such modifiers can hang.

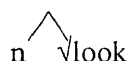
- (6) a. John closed the door partway.
 b. Roger filled the glass halfway.

(Tenny (2000:304))

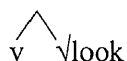
Given this fact, Pykkänen claims that causative transitive verbs in English should be decomposed into a causing event and a caused state structurally, though not in the way illustrated in (1).

Following recent studies of the morphology-syntax interface, Pykkänen assumes that entities such as nouns and verbs are not syntactic primitives, but are derived in the syntax by combining category-neutral roots and category-defining functional heads such as *v* (deriving verbs), *n* (deriving nouns), and *a* (deriving adjectives) (Marantz (1997)). Then, under this theory, the noun *look* and the verb *look* are assumed to have the same root but different functional heads, as illustrated in (7) (the symbol $\sqrt{}$ represents a root):

(7) a. look (Noun)



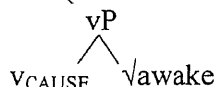
b. look (Verb)



(Pykkänen (2002:94))

Within this framework, Pykkänen proposes that causative transitive verbs in English are formed by combining a verbal functional head v_{CAUSE} and a category-neutral root as its argument. For example, the verb *awake* in (4a) is analyzed as having the following structure:

(8) awake (causative transitive verb)



Note that under this analysis, causative verbs involve just one verb but have an embedding structure.

Let us then look at how Pykkänen accounts for the interpretation of the adverbs discussed above. As for the manner adverb *grumpily* in (4a), she assumes that it can attach only to a verbal element. The structure in (8) has just one place on which the adverb can hang, that is, *vP*: the adverb cannot be combined with the root since the root is not a verbal category by definition. For this reason, the adverb necessarily modifies the causing event in (4a).²

Concerning the degree adverbs such as *partway* in (6), Pykkänen claims that they attach to the root in the structure in (8). She notes that these adverbs appear

² Although Pykkänen (2002) does not provide a structure for the unaccusative counterpart in (4b), it is conceivable that under her analysis, unaccusative verbs are formed by combining a noncausative verbal functional head and a category-neutral root, like the verb *look* in (7b). Then the manner adverb in (4b) is assumed to attach to the projection of the verbal head and modify the whole event of Bill's awakening.

even in the absence of a verbal element. For example, as shown in (9), they can occur in NPs and modify adjectives derived from the roots of causative verbs such as *open* and *fill*:

- (9) a. a partway open door
b. a mostly full room

(Pylkkänen (2002:101))

If the degree adverbs attach to the root of the structure in (8), it should modify the resultant state rather than the causing event. Pylkkänen accounts for the interpretation of these adverbs in (6) in this way.

According to Pylkkänen, these degree adverbs are contrasted in this respect with the manner adverb *grumpily* in (4a). She mentions that the manner adverb cannot modify the adjective corresponding to the causative verb in the example:³

- (10) *a grumpily awake boy (Pylkkänen (2002:101))

Under her analysis, this example is ruled out because manner adverbs are assumed to attach only to a verbal element.

In this subsection, we looked at an alternative analysis of causative transitive verbs in English proposed by Pylkkänen (2002). She considers that these verbs in English are formed by combining a category-neutral root and a verbal functional head having a causative meaning. She claims that this accounts for why degree adverbs, and not manner adverbs, can modify the caused event expressed by the causative verbs, assuming that degree adverbs, and not manner adverbs, can attach to the root.

3. Further Observation of the Distribution of Adverbs

In this section, we further examine the distribution of the manner and the degree adverbs discussed in the last section. The data provided here cast doubt on Pylkkänen's (2002) analysis of the adverbs and the structure of causative transitive verbs we saw above. In section 3.1, we look at examples that question her claim that manner adverbs can appear only in a verbal environment, whereas degree adverbs can attach to a category-neutral root. In section 3.2, we investigate both types of adverbs modifying causative verbs of change of location, which are not discussed in Pylkkänen's study. It is shown that degree adverbs are subject to a restriction that is not predicted under her analysis. Furthermore, we see that manner adverbs do exhibit scope ambiguity with this type of causative verb, which seems to pose a fundamental question to Pylkkänen's analysis.

³ Our informants observed that the example in (10) is acceptable. See note 4 for this point.

3.1. *Category Specification for Adverbs*

Pylkkänen (2002) considers that the degree adverbs in (6) are category-neutral, noting that they can modify adjectives in NPs, as shown in (9). If these adverbs are indeed category-neutral, we predict that they also combine with roots of some nouns. However, this prediction does not seem to be borne out. As shown in (11), these adverbs cannot modify nouns in NPs, even if we choose nouns referring to properties that can hold to varying degrees:

- (11) a. * John is a partway/halfway genius. (cf. John is somewhat genius.)
 b. * Tom's mostly hunger made him eat fast.
 c. * Bill is a completely fool. (cf. Bill is completely foolish.)

As far as we can see, these degree adverbs can modify verbs and adjectives, and not nouns.

Pylkkänen also attempts to show that the manner adverb in (4a) can attach only to a verbal category, mentioning that it cannot modify the adjective in an NP in (10). However, our informants have observed that manner adverbs can indeed modify an adjective in an NP, as shown in (12):⁴

- (12) a. a reluctantly sober man
 b. an unwillingly awake boy
 c. a carelessly naughty boy

These adverbs behave like the adverb in (4a) when they occur with causative verbs: they modify the causing event, and not the caused one:

- (13) a. Mary dried her baby reluctantly.
 b. Mary awoke John unwillingly.
 c. The kidnaper killed John carelessly.

These facts suggest that there is no correlation between adverbs' modifying a caused event and their occurrence in a nonverbal environment. This indicates that the examples in (9) and (10) do not provide evidence for Pylkkänen's (2002) analysis of the adverbs in (4a) and (6).

The manner adverbs cannot modify nouns, as shown in (14), which is the same as the degree adverbs we saw in (11):

- (14) a. * an unhappily boy (cf. an unhappy boy)
 b. * a reluctantly man (cf. a reluctant man)
 c. * a carelessly boy (cf. a careless boy)

⁴ I asked two informants about the examples in (12) and Pylkkänen's in (10). One speaker said that these examples including the one in (10) are acceptable, though not natural, indicating that (12c) is less natural than the others. The other speaker observed that these phrases are all acceptable, though the one in (10) sounds awkward in rhythm.

Thus, the two types of adverbs do not seem to be distinguished by their orientation for category: they can modify verbs and adjectives, and not nouns. The difference in interpretation between the two pointed out by Pylkkänen in (4a) and (6) would have to be attributed to another factor.

In this subsection, we provided examples that question Pylkkänen's claim that manner adverbs can appear only in a verbal environment, whereas degree adverbs can attach to a category-neutral root. We concluded that the two types of adverbs are parallel in that they can modify verbs and adjectives, and not nouns. Then we noted that it would be difficult to maintain her analysis of the difference in the interpretation of the adverbs between (4a) and (6) in terms of whether they are category-neutral or not.

3.2. *Two Kinds of Causative Verbs*

In the previous studies of adverbs modifying causative verbs by Fodor (1970) and Pylkkänen (2002), only those verbs describing change of state such as *melt*, *kill*, and *awake* are considered. We indicate here that a different pattern is observed with respect to the interpretation of degree and manner adverbs if we look at causative verbs depicting change of location.

3.2.1. *The Interpretation of Degree Adverbs*

Let us consider degree adverbs first. The relevant difference is noticed by Tenny (2000) (see also Tenny (1994)). She indicates that when degree adverbs ('measure adverbs' in her term) modify the endstate of an event, they measure out the progress made through the event. This yields the interpretation in which the adverbs describe a degree to which the event is completed. Moreover, she argues that to have the measure interpretation for these adverbs, a gradable object or path, which is translated into a measure, must be involved in the event. With change of state verbs, (the referent of) the direct object has the gradable property and functions as the measurer of the event, which we can see in the interpretation of the adverbs in (6). With change of location verbs, the measure reading is available only if a gradable path is present in the event. This is illustrated by the following examples:

- (15) a. John brought his children to the party partway.
- b. The kidnapper took the children to the park partway.
- (16) a. *David put the book on the table partway. (Tenny (2000:307))
- b. *Mary dragged her baby out of the bed halfway.

The adverbs in (15), and not those in (16), receive the measure interpretation. This is because the events depicted in the examples in (15) have a path, whereas those in (16) do not.

Note that in order to have the measure reading of the adverbs in (15), the goal

phrases are necessary. Thus, the examples are unacceptable without them, as shown in (17):⁵

- (17) a. *John brought his children partway.
- b. *The kidnapper took the children partway.

It seems difficult to explain this fact straightforwardly under Pylkkänen's (2002) analysis. She claims that these adverbs combine directly with a root and modify it. The roots of the verbs in (17) would be the same as those of the verbs in (15). Without any further device, it would be left unaccounted-for why a goal phrase is needed when the verbs are modified by the degree adverbs.

3.2.2. *The Interpretation of Manner Adverbs*

Let us look at manner adverbs next. As we saw in section 2, Pylkkänen (2002) claims that these adverbs modifying causative transitive verbs in English do not exhibit scope ambiguity. This seems to be true for causative verbs of change of state. In parallel to the adverb in her example in (4a), those in the following examples with change of state verbs modify the causing event, and not the caused event:

- (18) a. Mary dried her baby reluctantly.
- b. The kidnapper killed John carelessly.
- c. Mary sobered John grumpily.
- d. Mary warmed her child happily.

However, we find a different pattern of interpretation with change of location verbs. Our informants have observed ambiguity with respect to the scope of the manner adverbs in (19):⁶

- (19) a. John brought his children unhappily to the party.
- b. Mary sent John reluctantly to the doctor.
- c. Tom put his children happily on the bed.
- d. The kidnapper took the children carelessly to the park.

The adverb in each example is interpreted as depicting either the causer's manner or the causee's one. Thus, for example, the sentence in (19a) is true in either of the following situations: (i) John, and not his children, behaved unhappily or (ii) his children, and not John, behaved unhappily.

The examples in (19) would be difficult to explain under Pylkkänen's (2002) analysis of causative verbs illustrated in (8). Since the manner adverbs do not seem

⁵ One of our informants noted that the sentences in (17) are acceptable if a goal is understood implicitly in the discourse, otherwise they are ill-formed.

⁶ I consulted three English speakers about the interpretation of the adverbs in (19). Although one of them found the reading in which the adverb modifies the agent is much easier to obtain than the one in which it modifies the theme, all of them observed that either interpretation is available.

4. An Alternative Analysis of the Scope of Manner Adverbs

We saw in the last section that there are some examples that cast doubt on Pylkkänen's analysis of the structure of causative verbs and degree and manner adverbs modifying them. Although I do not pursue the matter of the degree adverbs any further here, I argue in this section that the interpretation of the manner adverbs is explained under the VP-shell analysis of causative verbs. The analysis not only captures the ambiguity of the adverbs modifying change of location verbs in (19) but also provides us with an account of the unambiguity of the adverbs with the change of state verbs in (18). First, we consider the mechanism that is assumed to license the adverbs proposed by Travis (1988) in 4.1. Next, on the basis of the mechanism, I propose an analysis of the adverbs for the two types of causative verbs in 4.2.

4.1. Licensing Conditions on Adverbs

Travis (1988) studies the distribution and the interpretation of manner adverbs such as *carelessly*, *reluctantly*, and *unwillingly*, and proposes a syntactic mechanism that licenses them (see also Jackendoff (1972) and McConnell-Ginet (1982) for these adverbs). She suggests that these manner adverbs are either subject sensitive or agent sensitive, depending on where they appear in the sentence:

- (21) a. The police carelessly will arrest Fred.
- b. Fred carelessly will be arrested by the police.
- c. The police arrested Fred carelessly.
- d. Fred was arrested carelessly by the police.

(Travis (1988:285), see also Jackendoff (1972:82-83))

When the adverb appears between the subject and the auxiliary verb as illustrated in (21a,b), it refers to the subject of the sentence regardless of whether the subject is agent or not. That is, the police are interpreted as being careless in (21a), whereas it is Fred who is being careless in (21b). On the other hand, when the adverb appears in a post-VP position as in (21c,d), it refers to the agent of the sentence whether the agent is the subject or not. Thus, the police are interpreted as being careless in both (21c,d).

Travis argues that this difference in the interpretation of the adverb comes from the difference in which head licenses the adverb, or more exactly, which feature of a head licenses it (Travis (1988:299)). She assumes that the subject sensitive adverb in (21a,b) is licensed by the AGR feature of INFL, and it assigns an adjunct theta-role to the subject coindexed with AGR.⁸ On the other hand, the agent sensitive adverb in

⁸ Following Zubizarreta (1982) and Travis (1988), I refer to the theta-roles assigned by adjunct predicates as adjunct theta-roles.

(21c,d) is licensed by the Manner feature of V, and it assigns an adjunct theta-role to the external argument of the verb.

Furthermore, Travis indicates that in English, adverbs may appear anywhere as long as they are along the projection line of the licensing head. This is shown for an adverb licensed by AGR of INFL in (22) and for another licensed by Manner of V in (23):

- (22) a. Quickly John had finished his meal.
- b. John quickly had finished his meal.
- (23) a. Mary will have put the book slowly on the table.
- b. Mary will have put the book on the table slowly.

(Travis (1988:291, 294))

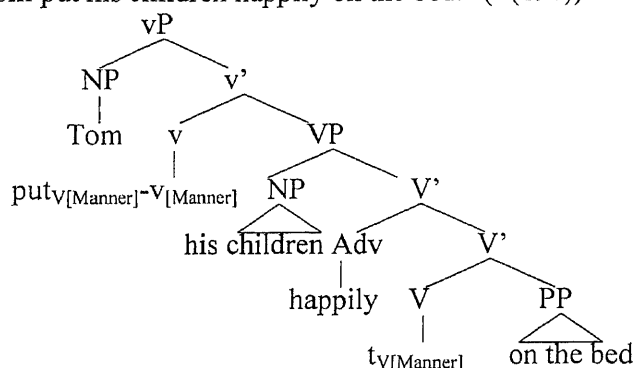
She explains this relatively free distribution of these adverbs by appealing to feature percolation from the head to the maximal projection. As for (22), since AGR feature percolates from I to IP, the adverb is assumed to be adjoined to IP in (22a) and to I' in (22b). Concerning (23), since Manner feature percolates from V to VP, the adverb is assumed to be adjoined to V' in (23a) and to VP in (23b).

In this subsection, we considered Travis' (1988) analysis of the interpretation and the distribution of adverbs. She proposes that adverbs are licensed by a certain feature of a head. They are interpreted as modifying an element to which their licensing head is related, assigning an adjunct theta-role to it. She argues that the licensing features of adverbs percolate from the head to the maximal projection. This allows the adverbs to appear anywhere along the projection line of the licensing head.

4.2. *Manner Adverbs in VP-Shell Structures*

On the basis of Travis' study, I would like to propose an analysis of the manner adverbs modifying the causative verbs we have seen in this paper. Let us consider those modifying change of location verbs in (19) first. As we saw above, Travis assumes that the Manner feature of V licenses manner adverbs referring to agent NPs. I would like to extend this analysis to the manner adverbs that refer to the theme NPs in (19). I assume that the verb in (19c), for example, has the arguments and the adverb generated in the following VP-shell structure in (24):

(24) Tom put his children happily on the bed. (= (19c))



Given the facts we saw in (20), I assume that the adverb and the locative PP are in lower positions than the theme NP. In particular, the lower verb *V* selects the PP as its complement and the theme as the specifier of the VP (Larson (1988), Baker (1995)). The manner adverb is adjoined to *V'* in the VP. This VP is selected by the upper verb *v* as its complement and the agent projects as the specifier of the upper *vP*. Furthermore, I assume that both *V* and *v* have a Manner feature since they are both verbal categories. *V* is assumed to raise overtly to *v* (Chomsky (1995), cf. Larson (1988)).⁹

Given this configuration, the Manner feature percolates from *V* to *VP* (and *v* to *vP*) and licenses the adverb in the lower VP. Recall that the manner adverbs in (19) can modify either the causing or the caused event: they can be construed with either the agent or the theme argument. This is accounted for if we assume with Travis (1988) (see also Zubizarreta (1982)) that an adverb assigns an adjunct theta-role to an argument that is syntactically related to the adverb's licensing head. In (24), since *V* as the licenser of the adverb moves from the lower VP to the upper *vP*, not only the Spec of VP but also that of *vP* is related to *V*. This allows the adverb to assign its theta-role to either the theme or the agent NP.

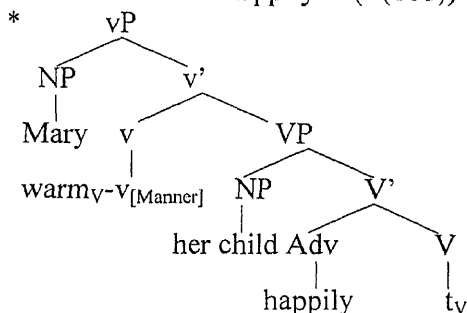
Next, let us consider how the present analysis accounts for the manner adverbs modifying causative verbs of change of state in (4a) and (18). Recall that in these examples, the adverbs can modify only the causing event: they are construed with the agent, and not with the theme. I assume that these verbs also have a VP-shell structure, with the theme generated in the lower VP and the agent in the upper *vP*, and involve overt verb raising. However, I propose that these verbs are different from causative verbs of change of location in that only the upper verb, and not the lower

⁹ Agent NPs are assumed to move overtly from the Spec of *vP* to the Spec of IP (or TP) in English active sentences, though this is not shown in the structures for (24) and the other examples in this paper.

verb, has the Manner feature.¹⁰

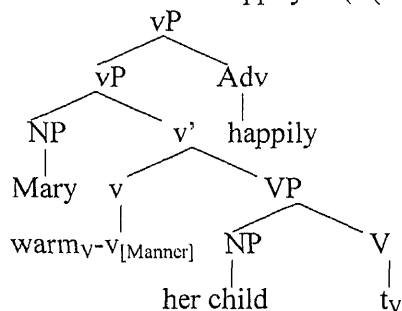
Let us see in what structure the manner adverbs can be licensed under this proposal. First, if the adverbs appear anywhere in the lower VP, they cannot be licensed because the head of VP does not have the Manner feature. This is shown in (25) for (18d):

(25) Mary warmed her child happily. (= (18d))



Then, the adverbs must be generated somewhere outside VP. Since the adverb appears at the end of the sentence in (18d), it can be adjoined to the right of vP, as illustrated in (26):

(26) Mary warmed her child happily. (= (18d))



In this configuration, the adverb is licensed by the Manner feature of the upper verb, which percolates from v to vP. The adverb then assigns an adjunct theta-role to the argument of v, that is, the agent. Note that the adverb cannot assign the theta-role to the theme in the lower VP, since v is not related to the argument at any point of the derivation. In this way, we can account for why the adverbs in (4a) and (18) can

¹⁰ I assume that all causative verbs are the same with respect to the nature of v, but they vary in the properties of V. This seems reasonable, given that v is a functional category and V is a substantive category (Chomsky (2000)). It is then conceivable that the verbs vary with respect to whether V has the Manner feature or not. I leave it for future research to investigate whether the distinction between the two types of causative verbs concerning the feature is derived from any fundamental differences between them. Cf. Hale and Keyser's (1993) analysis of transitivity alternations of some causative verbs in English, where they propose that verbs are distinguished by whether or not they have a manner component modifier in their lexical representations.

modify the causing event, and not the caused event.¹¹

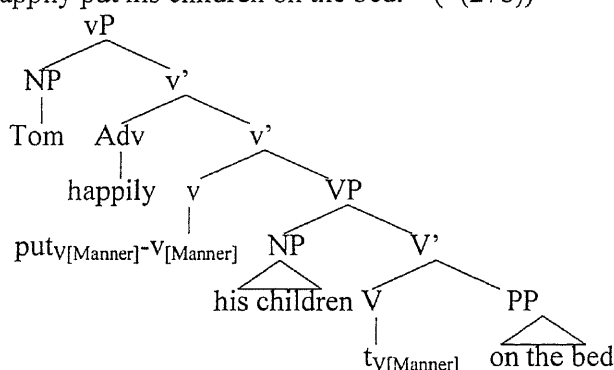
This line of analysis is supported by the following fact. Even with change of location verbs, the adverbs can modify only the causing event if they appear between the subject and the verb. That is, the adverbs in (27) can be construed with the agent, and not with the theme, in contrast with the adverbs in (19) and (20):

- (27) a. Mary reluctantly sent John to the doctor.
 b. Tom happily put his children on the bed.
 c. The kidnapper carelessly took the children to the park.

These data show that the interpretation of the manner adverbs under discussion is not just a matter of a lexical difference between change of location and change of state verbs, but is concerned with the adverbs' syntactic positions.

Let us consider how the examples in (27) are explained under the present analysis. Since the adverbs are in the preverbal position, they are considered to be somewhere in vP or in a higher projection such as IP, and not in VP. If we assume that the adverb is adjoined to v', (27b), for example, is given the following structure for the relevant part:

- (28) Tom happily put his children on the bed. (= (27b))



Being within the projection of v, the adverb in (28) must be licensed by the Manner feature of v, and not by that of V. The adverb then assigns an adjunct theta-role to the agent, and not to the theme, like the adverb in (26).¹²

¹¹ The present analysis has the following predictions. Adverbs can assign their adjunct theta-role to an NP in a higher projection if their licensing head moves up to the projection, which we claim occurs in (24). However, no adverbs could give their theta-role to an NP in a lower projection given that no heads can move to a lower position (cf. Travis (1984)). The latter prediction is borne out with respect to the examples in (27). I thank reviewers of *TES 25* for helpful comments on this point.

¹² The manner adverbs can appear at the end of a sentence with a change of location verb, as shown in (i):

(i) Tom put his children on the bed happily.

One of our informants observed that the adverb can modify either the agent or the theme, though the reading construed with the theme is weaker than the corresponding reading obtained in (19), where the

Finally, note that it would be difficult to explain the data we have analyzed here under the hypothesis that causative verbs project only into a single VP. In order to account for the ambiguity in (19) and (20), advocates for such a hypothesis might claim that a manner adverb in a VP can refer to any NP in the VP (or modify either the causing or the caused event expressed by the verb). Under such an analysis, it would be left unexplained why the adverbs cannot refer to the theme NP (or modify the caused event) in (4a), (18), and (27), where the adverbs can be assumed to be in the VP.

In this subsection, I argued that the interpretation of the manner adverbs discussed in section 3.2.2 is explained under a double-VP analysis. Following Travis (1988), I proposed that these adverbs are licensed by the Manner feature of a verbal head and assign an adjunct-theta role to an argument related to the head. The change of state verbs are distinguished from the change of location verbs in that the lower verb does not have the Manner feature. We also saw that this line of analysis is supported by the fact that the interpretation of the adverbs changes depending on their positions in the sentences. Finally, it was noted that the facts considered here are difficult to explain under the assumption that causative verbs project into a single VP.

5. Conclusion

It was claimed in some previous works that causative transitive verbs in English do not exhibit scope ambiguity with respect to adverbs. By examining the interpretation of manner adverbs, we have observed here that this holds true for those verbs describing change of state, and not for those verbs depicting change of location. The data provided here have indicated that there are two constituents under INFL (or T) that the adverbs can be construed with. I have argued that the data are explained under a double-VP analysis of causative verbs on a principled ground. However, they seem to be difficult to account for under a single-VP analysis or the one that decomposes these verbs into a causative verb and a category-neutral root.

adverb appears between the object NP and the PP. Although it is not clear why the acceptability of the theme reading varies depending on the position of the adverb, it is consistent with the present analysis that this example is ambiguous. This is because the adverb at the end of the sentence is analyzed as being adjoined to the right of either VP or vP (or IP). It should modify only the agent if it attaches to vP (or IP), while it should refer to either the agent or the theme when it hangs on VP.

According to Pykkänen (2002), the manner adverb in the unaccusative construction in (4b) can modify the theme, in contrast with the same adverb in its causative counterpart in (4a). Although it is beyond the scope of the present study to consider the structure of unaccusative verbs, the adverb in (4b) may be adjoined to the right of IP and licensed by the AGR feature of INFL. The adverb then assigns an adjunct theta-role to the theme subject that is raised to the Spec of IP and coindexed with AGR (see section 4.1).

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